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AUTHOR Hattie, John A.; And Others
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ABSTRACT

Measures of both preferred and actual classroom and school environment were administered to 1,675 secondary school students in New South Wales (Australia). Shortened versions of the My Class Inventory, Classroom Environment Scale, and Individualized Classroom Environment Questionnaire, as well as the Quality of School Life questionnaire were administered. Alpha reliability estimates indicated extremely high test reliability for the 19 scales in the four instruments. Maximum likelihood factor analysis revealed four factors from all the scales: (1) preference for peer conflict; (2) preference for individualization; (3) preference for teacher-managed structure; and (4) actual rather than preferred environment. Cluster analysis, using a non-hierarchical ISODATA approach, revealed a three-cluster solution: schools were broadly labelled as self-survival, indifferent, or cooperative and motivated. Multivariate analysis of variance indicated significant effects for school type, sex, and grade. English and mathematics achievement were more highly correlated with actual school environment than with preferences in environment. (GDC)

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RESEARCH INTO STUDENTS' PERCEPTIONS OF PREFERRED AND ACTUAL LEARNING ENVIRONMENT

JOHN A. HATTIE and DANIELLE BYRNE
University of New England
Armidale, New South Wales, Australia 2350

BARRY J. FRASER
Western Australian Institute of Technology
Bentley, Australia 6102

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ABSTRACT

This study involved administration of preferred classroom environment and actual school environment measures to a sample of 1,675 students from 18 schools in New South Wales, Australia. Whereas classroom environment was measured with short forms of the My Class Inventory, Classroom Environment Scale, and Individualized Classroom Environment Questionnaire, school environment was assessed with the Quality of School Life questionnaire. Data were analysed in five different ways to answer various types of questions. First, a set of analyses attested to the high reliability of all the environment scales. Second, a maximum likelihood factor analysis suggested that there are four distinct groups of classroom environment scales which might be labelled tentatively as "preference for peer conflict", "preference for individualization", "preference for teacher-managed structure", and "actual environment". Third, a cluster analysis revealed three distinct typologies of schools which might be called "self-survival", "indifferent", and "cooperative and motivated". Fourth, a multivariate analysis of variance revealed some interesting grade level and gender differences in students' learning environment perceptions. Fifth, some associations between student achievement and classroom environment factors were found.

In classroom environment research, the actual classroom environment has been studied for a longer period and more extensively than the preferred classroom environment (Chavez, 1984; Fraser, 1981a, 1985, 1986a; Fraser & Walberg, 1981; Moos, 1979; Walberg, 1979). Hence there is still a need for research which will lead to a clearer understanding of the kinds of learning environments that pupils prefer, whether in the classroom or in the school as a whole. A central question is whether there is one ideal environment that is perceived uniformly by all students, or whether the ideal depends on moderators such as the student age, gender, and actual environment.

The present study contributes to the field of classroom environment because it made use of preferred classroom environment instruments in pursuing several research purposes for which preferred scales have not been used previously. One purpose was to use factor analysis to identify a parsimonious set of dimensions underlying preferred classroom environment scales. Another purpose involved using cluster analysis of students' school mean scores on the preferred and actual environment scales to identify distinctive types of schools. Yet another aim was investigation of the influence of moderating variables including grade and gender on students' perceptions of preferred classroom environment.

BACKGROUND

As far as many educators are concerned, the ideal classroom or school environment is that which is conducive to maximum learning and achievement. The majority of classroom environment research, therefore, has examined the effect of actual environment on achievement (Fraser, 1986). This extensive research suggests that well-developed personal relationships among students are very important. Haertel, Walberg, and Haertel (1981) labelled this condition "cohesiveness". Similarly, the meta-analysis of Johnson, Maruyama, Johnson, Nelson, and Skon (1981) led to the conclusion that cooperation within the class promotes higher achievement than competition, and that this is the case across all subject areas, for all age groups, and for a wide variety of tasks. Nevertheless, the meta-analysis of Johnson and colleagues has been criticized by Cotton and Cook (1982) and McGlynn (1982), who emphasized the importance of interactions between achievement outcomes and situational moderators. In a rejoinder, Johnson, Maruyama, and Johnson (1982) reviewed research on many possible moderators but could find little support for their existence. Johnson and colleagues reiterated that the advantages of cooperation for increased achievement prevailed across a wide variety of tasks, even when the tasks were selected to demonstrate the superiority of competition.

Unfortunately, there have been too few studies to permit a meta-analysis of research on students' preferred environment and their achievement outcomes. It is not generally known how preferred environments relate to achievement or whether the type of learning environment that is ideal for academic achievement corresponds to the student's ideal. Parent, Forward, Canter, and Mohling (1975) found that, where university students' individual preferences were met as far as the amount of external control was concerned, they did attain

higher achievement levels. Moreover, in person-environment fit studies, it was found that the relationships between achievement and actual classroom individualization were positive for students higher in preferred individualization but negative for students lower in preferred individualization (Fraser & Fisher, 1983a; Fraser & Rentoul, 1980). But it has been pointed out also that it can depend on the goals of the educators whether the preferred environment is beneficial or not (Moos, 1979).

The answers to these questions about relationships between outcomes and preferred environment are complicated because different studies are based on different instruments (as are those relating to actual environments) which measure different dimensions. Among the instruments that have been used for the study of preferred environment are the Classroom Environment Scale (CES; Moos & Trickett, 1974; Trickett & Moos, 1973), which is used mainly for secondary schools (cf. Fraser & Fisher, 1983b; Fisher & Fraser, 1983a, 1983b; Moos, 1979) and the My Class Inventory (MCI; Fisher & Fraser, 1981), which is useful for elementary schools and was developed from Fraser, Anderson and Walberg's (1982) Learning Environment Inventory. In order to measure aspects of individualization not tapped adequately by these two instruments, Rentoul and Fraser (1979) developed a further instrument, the Individualized Classroom Environment Questionnaire (ICEQ), which is suitable for assessing dimensions of classroom individualization or openness at the secondary school level (Fraser, 1986b; Fraser & Fisher, 1983a). All three instruments appear now in shortened versions, with fewer items in each scale (and with fewer scales in the case of the CES) (B. Fraser, 1982; Fraser & Fisher, 1983c). Table 1 lists the scales within these three instruments.

All scales displayed reasonable estimates of reliability in prior research. For the short forms, Fraser and Fisher (1983c) reported alpha reliabilities varying from .56 to .84 (preferred) and from .64 to .85 (actual). For the same scales used in the long forms and assessing the actual environment, Fraser (1981a) reported test-retest reliabilities of .46 to .86. The correlations between the short and long forms were very high for most scales, ranging for actual and preferred forms from .78 to .97 (Fraser & Fisher, 1983c).

As yet, there is only a single study (Fraser & Fisher, 1982) in which more than one of these three main instruments have been administered together. Thus there are several questions which call for an investigation. Concerning the overall instruments, the question remains as to the extent to which the CES and the MCI indeed cover the same dimensions and to what degree the ICEQ is related to one or both of them. In addition it would be worth exploring whether the scales in any of the instruments are closely related to each other solely within, or also across, instruments.

From studies where perceptions of the actual environment have been compared with those of the preferred environment, it is evident that there are aspects in the classroom environment that were consistently preferred by pupils in elementary and junior high schools. These include more Cohesiveness (from the MCI) or Affiliation (CES) and less Competitiveness/Competition (MCI and CES;

Table 1

Scale Descriptions for Classroom Environment Scale (CES), My Class Inventory (MCI), and Individualized Classroom Environment Questionnaire (ICEQ)

Scale	Description
Classroom Environment Scale	
Involvement	Students' attentiveness
Affiliation	Students' social awareness of each other
Teacher Support	Teacher's help and personal attention
Task Orientation	Amount of stress placed on curricular activity
Order & Organization	Orderly behavior and organization of class
Rule Clarity	Students' knowledge of rules and consequences of breaking them
My Class Inventory	
Satisfaction	Enjoyment of class
Friction	Aggressive behavior of students
Competition	Importance of students' achievement relative to that of their peers
Difficulty	Difficulty of class work
Cohesiveness	Friendly relationship between students
Individualized Classroom Environment Questionnaire	
Personalization	Teacher's helpfulness and personal attention
Participation	Students' input in class work or discussions
Independence	Students' control over their work habits and general behavior
Investigation	Students' own research
Differentiation	Students' freedom to work at their own pace and in their own style

cf., Fisher & Fraser, 1983a; Fraser, 1984; Fraser & Deer, 1983; Moos, 1979). In this respect the preferences of the students were very similar to what Johnson, Maruyama, Johnson, Nelson, and Skon (1981) and Haertel, Walberg, and Haertel (1981) found to be salient in actual environments in aiding or hindering achievement.

In addition to the scales measuring personal relationships between students, there are other scales measuring the relationships between teacher and students. Studies using the CES (Fisher & Fraser, 1983a; Moos & Trickett, 1974) demonstrated that high school students preferred more Teacher Support but not significantly more or less Teacher Control; that is, they preferred friendliness rather than authority. The importance of the friendliness of the teacher was also documented by Dorhout (1983) in a study with academically gifted children in Grades 5 to 12. With the aid of the Preferred Instructor Characteristics Scale (Krumboltz & Farquhar, 1957), Dorhout found that both primary and secondary pupils preferred what were labelled personal-social, rather than cognitive-intellectual, attributes in their teachers. For example, it was more important to the pupils that teachers were "friendly" or would "make the classroom pleasant" than that they were "an expert" or would "think logically". Taken together, these findings suggest that a more friendly atmosphere among the pupils, and between the pupils and the teachers, is desired commonly by pupils.

There are some dimensions of preferred classroom environment related to cooperation among students, and between teachers and students, and these include discipline, amount of individualization, and the degree of competition.

There are strong individual differences concerning the amount of discipline or external control that students preferred (Fisher & Fraser, 1983a; Moos & Trickett, 1974; Parent, Forward, Canter & Mohling, 1975). Similarly, the amount of preferred individualization, as measured by the ICEQ, and the preference for personal help from the teacher varies across individual students from elementary school onwards (Kuse & Allar, 1971). Competition, which in general is not desired by pupils, also seems more preferable to some individuals than to others. This can be inferred from the finding that there was more variance in preferred competition across students than in other scales (Fisher & Fraser, 1983a; Fraser & Fisher, 1983c; Moos & Trickett, 1974). There are, however, no data concerning the personality of those pupils who prefer more competition or more discipline; that is, it has not been demonstrated how or why such students develop personal styles in their preferences for various environments.

It might be that personal styles are related to the gender or age of the student or to school typologies. The studies in which school typologies in actual classrooms have been examined (Moos, 1979; Trickett, 1978) have demonstrated that the differences between urban, suburban and rural schools were small, while vocational and alternative schools differed greatly from the others and each other. In vocational schools there was an above-average perception of Competition, Rule Clarity, and Teacher Control. In alternative schools there was an above-average perception of Involvement,

Affiliation, Teacher Support, Order and Organization, and Rule Clarity and a below-average perception of Teacher Control and Competition. But Moos concluded that, for the bulk of schools (urban, suburban, and rural), "the overall contrasts among these three types of schools may be less salient that the differences between classes within each type" (1979, p. 165). There is a need to study whether, and how, differences in the perception of the actual learning environment manifest themselves also in related differences in the preferences for the ideal learning environment. Such studies should be aimed not only at individuals (using moderators such as gender and age), but also at whole schools or school types (according to geographical, socioeconomic, or administrative considerations).

Thus the unit of analysis for studies directed at preferred classroom environment is more appropriately the individual than the class. The ideal or preferred learning environment is not necessarily the same for each individual within a class. Nevertheless, the class or school could be the unit-of-analysis when making comparisons across schools or between actual and preferred environments. It does seem reasonable to explore individual classroom environment preferences within the school as a whole and also to analyse individual differences within and across schools.

In summary, the literature concerning preferred learning environments demonstrates that, overall, most pupils from elementary school onwards desire a high degree of cooperation between students and from the teacher. The questions that still need further exploration, however, concern the stability of all (social and academic) aspects of preferences across age, gender, and actual learning environments. Moreover, are there aspects in the environment of a school as a whole that transcend mere geographic distinctions (such as rural versus urban or suburban) and which moderate the perceptions and preferences of its pupils? If so, can they be identified? Finally, which of the three main instruments reviewed here (CES, MCI, and ICEQ) best measure(s) the preferred learning environment, alone or combined, and in what ways do they overlap?

METHOD

The sample consisted of 1675 students in Grades 7, 9, and 11 from 18 schools on the North coast of New South Wales, Australia. Schools were located in small cities, suburbs and rural areas, and approximately equal numbers of boys and girls participated. The four instruments that are relevant for this paper were administered as part of a larger battery, and thus not all persons responded to all instruments. Across the 18 schools, 1266 students responded to the CES, 1231 to the ICEQ, 1209 to the MCI, and 1675 to three scales from the Quality of School Life instrument (QSL; Williams & Batten, 1981; Epstein, 1981).

In each case the shortened versions of the three preferred classroom environment instruments described by Fraser and Fisher (1983c) were used. The scales within each instrument are listed in Table 1. The MCI contains 25 items of Yes-No format, the CES contains 24 items of True-False format, and the ICEQ contains 25 items of Likert format (with five response alternatives ranging from Almost Never to Very Often).

To assess the actual school environment, three scales from the QSL were selected; these are General Affect, Teachers, and Opportunity. General Affect includes items relating to the school as a happy place to be in, where learning is a lot of fun, and where the student feels satisfied. The items in the Teachers scale relate to student perception of teacher fairness, helpfulness, and willingness to listen. The Opportunity scale includes items relating to opportunities for successful performance and satisfaction with school work and to the knowledge of how to cope with school work. Each item is written as a continuation of the stem "School is a place where..." These scales have been subjected to extensive investigation and have yielded high estimates of reliability and excellent construct validity (see Williams & Batten, 1981).

ANALYSES AND RESULTS

There were five stages in the analysis of the data. First, estimates of reliability for the different preferred and actual classroom environment questionnaires were calculated. Second, the factor structure underlying the scales of the four instruments was examined. Third, a cluster analysis was used for the purpose of grouping schools according to similarities in their mean responses across the scales. Fourth, three-way multivariate analyses of variance were used to test whether type of school, gender, and grade level, either individually or in interaction, were associated with perceptions of preferred and actual classroom environment. Fifth, relationships between student achievement and classroom environment perceptions were explored.

Reliability

Alpha reliability estimates are shown in Table 2 for each of the 19 scales in the MCI, CES, ICEQ, and QSL. Reliabilities without exception were extremely high. Moreoever, if one compares the alpha values of any instrument with those of the others, it becomes apparent that none of the instruments can be favored over the others on the grounds of its superior reliability. These reliabilities are higher than those reported by Williams and Batten (1981) and Fraser and Fisher (1983c).

Factor Analysis

A maximum likelihood factor analysis (COFA; McDonald & Leong, 1974) was used to assess the dimensionality of the 19 scales. The following four distinct groups of scales emerged and were given names based on the content of individual items (not just the scale names) comprising each group:

Factor I: Preference for Peer Conflict. This consisted predominantly of the MCI's scales of Friction and Competitiveness, together with Difficulty to a marginal extent. This scale assesses the extent to which the student prefers or can tolerate conflict, competition, and aggression with peers in the classroom in contrast to a preference for harmony. Students with a low preference on this dimension would like classrooms characterized by the cooperative learning methods described by Slavin (1983) and Johnson, Johnson, Johnson Holubec, and Roy (1984).

Table 2

Estimates of Reliability (Alpha) for Each Scale in the Short Forms of One Actual and Three Preferred School Environment Instruments

Scale	Alpha Reliability	Scale	Alpha Reliability
QSL (Actual)		MCI (Preferred)	
Opportunity	.88	Satisfaction	.92
Teachers	.89	Friction	.89
General Affect	.90	Competitiveness	.92
CES (Preferred)		Difficulty	.84
Involvement	.91	Cohesiveness	.93
Affiliation	.93	ICEQ (Preferred)	
Teacher Support	.92	Personalization	.95
Task Orientation	.92	Participation	.95
Order & Organization	.90	Independence	.92
Rule Clarity	.92	Investigation	.93
		Differentiation	.88

Factor II: Preference for Individualization. It is interesting that the ICEQ's five scales of Personalization, Participation, Independence, Investigation, and Differentiation comprised the second factor. This finding provides support for the contention that the ICEQ taps dimensions not covered in other classroom environment instruments. This factor assesses the major dimension underlying the ICEQ, namely, student preference for classroom individualization or openness.

Factor III: Preference for Teacher-Managed Structure. Most of the remaining scales comprises the third factor which assesses the extent to which the teacher provides clear structure within the classroom. For example, this structure includes whether students are involved in class activities, whether the teacher is supportive of students, the emphasis on covering the curriculum, whether the class is orderly and organized, and whether classroom rules are clear.

Factor IV: Actual Environment. The last factor comprised all three scales from the actual environment instrument, the QSL. The fact that these three scales formed a separate factor supports the distinctiveness of actual and preferred classroom scales.

The goodness-of-fit statistics from the exploratory factor analysis are not reported because, not surprisingly, they were significant because of the large sample size. Instead, a restricted factor analysis was calculated (COSAN, C. Fraser, 1982) specifying four factors. Table 3 lists the loadings on the four factors, the standard error values and the uniqueness squared for each scale. The correlations between the factors were all positive and very similar, implying that there could be one second-order factor.

Cluster Analysis

Another question addressed was whether each school was unique in terms of its students' responses to the classroom environment instruments or whether there existed obvious groups among the schools. Schools were clustered according to the mean responses on the 26 preferred environment scales and on one actual environment scale, which was formed by summing the three QSL scales of Opportunity, Teachers, and General Affect (which were collapsed when preliminary examination of the means showed that they were always scored very similarly within one school). The cluster procedure used was a modified version of ISODATA (Ball, 1970; Blashfield & Aldenderfer, 1978; Cooksey, 1982; Hattie & Cooksey, 1984) which differs from other cluster analyses in that it is non-hierarchical. Up to 10 mutually exclusive clusters can be specified. In the modified version, the criterion for the most likely number of clusters is eta-squared in a scree-type test. A three-cluster solution was accepted for which eta-squared was .55. A four-cluster solution would have provided an eta-squared of .62 but, since only one school defined the fourth cluster, the three-cluster solution was preferred. (In moving from four to five clusters, the increase of eta-squared was only another 6 per cent.)

Table 3

Factor Loadings on Four Factors, Uniqueness Squared, Standard Errors, and Factor Correlations

Scale	Factor Loadings (SE)				U^2 (SE)
	I	II	III	IV	
Satisfaction	0	0	.57 (.02)	0	.68 (.02)
Friction	.90 (.03)	0	0	0	.19 (.04)
Competitiveness	.63 (.03)	0	0	0	.60 (.02)
Difficulty	.31 (.03)	0	0	0	.91 (.02)
Cohesiveness	0	0	.48 (.02)	0	.77 (.02)
Involvement	0	0	.82 (.02)	0	.33 (.01)
Affiliation	0	0	.65 (.02)	0	.58 (.02)
Teacher Support	0	0	.71 (.02)	0	.50 (.01)
Task Orientation	0	0	.61 (.02)	0	.63 (.02)
Order & Org.	0	0	.74 (.02)	0	.46 (.01)
Rule Clarity	0	0	.53 (.02)	0	.72 (.02)
Personalization	0	.87 (.02)	0	0	.25 (.02)
Participation	0	.87 (.02)	0	0	.24 (.02)
Independence	0	.59 (.02)	0	0	.65 (.02)
Investigation	0	.75 (.02)	0	0	.44 (.01)
Differentiation	0	.21 (.03)	0	0	.96 (.02)
Opportunities	0	0	0	.79 (.02)	.37 (.02)
Teachers	0	0	0	.77 (.02)	.41 (.02)
General Affect	0	0	0	.78 (.02)	.39 (.02)

Factor Correlations

I	1.00			
II	.36	1.00		
III	.57	.43	1.00	
IV	.27	.27	.38	1.00

Factor I Preference for Peer Conflict
Factor II Preference for Individualization
Factor III Preference for Teacher-Managed Structure
Factor IV Actual Environment

The three clusters or groups of schools comprised eight, six, and four schools, respectively. Table 4 illustrates these differences, together with some informal observations made about the relevant schools by the persons gathering the data. School Type A (including 8 of 18 schools) perceived the actual school environment as medium, and its students scored highest on the preferred Peer Conflict scales, medium to high on the preferred Individualization scales, and medium to low on the preferred Teacher-Managed Structure scales. This type of school might be called "Self-Survival" because its most distinctive feature is its students' tolerance of conflict among peers. The pupils of School Type B (with only 4 schools) had the lowest (but nevertheless positive) opinion about the actual school environment, and they indicated the lowest desire for classroom Structure and Individualization. Their preference for Peer Conflict was medium to low. This school type might be labelled "Indifferent" because of students' dislike of both individualized and structured classroom learning environments. In School Type C (comprising 6 schools), the pupils rated their actual environment most favorably. They scored highest on preferred Structure and Individualization scales and lowest on the preferred Peer Conflict scales. This type could be called "Cooperative and Motivated" because of students' dislike of peer conflict and their positive attitude toward both individualized and structured classroom learning environments.

It is interesting to note that the type of school where the researchers had sensed immaturity in the students (Type B) in their visits to the schools was rated least favorably by the students. The finding that students did not desire the more favorable classroom conditions (in the Individualization and Structure aspects), however, could be ascribed to a certain despondency. It might be less surprising that the pupils who behaved in the most orderly and well-disciplined and cooperative way (Type A) expressed a desire for more Peer Conflict (i.e., Friction and Competitiveness). The question of whether there was a causal relationship between students' high opinion about their actual environment in Type C schools and their high aspirations and bright and eager appearance (to the experimenters during their visits) is addressed below.

MANOVA for Moderators of Environment Perceptions

Since the factor structure supported four different groups of scales, a separate three-way multivariate analysis of variance (MANOVA) was performed for each of the four groups to test the effects of school type (as obtained from the cluster analysis), grade level (7, 9, and 11), and gender, and their interactions. These analyses were also based on the item sums for each scale, rather than on the raw item scores. The overall significance level was set at .05, but since there were four separate analyses, the Bonferonni test of significance was applied. That is, the familywise error divided by the number of analyses calculated provided the planned alpha (i.e., .05/4 = .0125).

In each of the four analyses there were significant main effects for school type, gender, and grade, and only in some instances were there significant interactions of gender by grade or of school by grade. However, there were no significant interactions of gender and

Table 4

Actual and Preferred Learning Environment of the Three School Types and Informal Comments about These Schools

School Type	N	Actual Environment	Preferred Environment			Data Gatherers' Impressions	
			Individual-ization	Structure	Peer Conflict	Principal	Students
A	8	Medium	Medium-high	Medium-low	Highest	Not content w. attitude	Well-behaved, orderly
B	4	Lowest	Lowest	Lowest	Medium-low	Authoritarian & nervous	Immature
C	6	Highest	Highest	Highest	Lowest	Status ori-ented	Bright, eager

Type A: Self-Survival
Type B: Indifferent
Type C: Cooperative and Motivated

school and of gender, grade, and school. F Values for all main effects and interactions are listed in Table 5.

Gender. The main effect of gender was statistically significant in all four analyses. Examination of the significant univariate F-tests for each scale and of the respective means for girls and boys revealed the following overall trends. Boys scored significantly higher than girls on preferred Friction, Competitiveness (MCI) and Differentiation (ICEQ); girls scored significantly higher than boys on all preferred Structure scales except Rule Clarity, as well as on preferred Personalization and Participation (ICEQ), and on actual General Affect and Teachers (QSL). However, it was found that girls and boys had similar preferences for the degree of Difficulty, Investigation, Independence, and Rule Clarity, and that they perceived similar actual Opportunity. Girls perceived in the actual class environment a greater amount of General Affect and of (positive attitude of) Teachers than boys, while boys and girls perceived a similar degree of Opportunity.

These gender differences would support past research (Owens & Straton, 1980) and the stereotypic notion that girls place greater value on social harmony and prefer competition less than boys, but that at the same time girls are not less academically motivated than boys. Whether the girls perceived too favorably their class environments in general and their teachers' qualities and attitudes in particular, or whether the teachers were actually "nicer" to girls than to boys, remains a question that only a further study involving teachers could answer.

Age or grade. In all four analyses there was a significant age or grade effect. There were only two scales for which the difference between the three grades was not significant; the scales were Affiliation (CES) and Differentiation (ICEQ).

The trends were not the same across scales, thus only in six cases was there a continuous increase or decrease from the lowest to the highest grade level in the preferences or in the perceptions of the actual school environment. Overall the Grade 11 pupils exhibited the greatest amount of variability: of the extreme high or low means (on the 17 scales with a significant univariate F-value) Grade 11 had 14, Grade 9 had 10, and Grade 7 had 7. In nine cases the difference between Grades 9 and 11 was greatest. Grade 11 students scored highest and Grade 9 lowest on the preferred Individualization scales of Personalization and Participation, and on the preferred Structure scales of Cohesiveness, Involvement, Teacher Support, Task Orientation, and Order and Organization. In addition, Grade 11 scored lowest and Grade 9 highest on the preferred Peer Conflict scales of Friction and Competitiveness.

Grade 11 students generally were somewhat disillusioned with their schooling, but nevertheless would prefer to be most mature, motivated, and socially adjusted. Grade 9 pupils showed overall the lowest preference for Individualization, demonstrating a need to prove themselves. Grade 7 preferred least Difficulty and most Rule Clarity, Satisfaction, and even slightly more Investigation than Grade 11.

Table 5

Main Effects and Interactions of School, Grade, and Gender in Multivariate Analyses of Variance for Each of the Four Factors

Effect	Preferred Individualization		Preferred Structure		Preferred Peer Conflict		Actual Environment	
	F (df)	p	F (df)	p	F (df)	p	F (df)	p
Main Effects								
School	7.02 (10,2344)	.001	8.12 (16,2742)	.001	9.94 (6,2468)	.001	11.02 (6.3216)	.001
Grade	14.35 (10,2344)	.001	12.95 (16,2242)	.001	25.38 (6,2468)	.001	17.52 (6,3216)	.001
Gender	8.92 (5,1172)	.001	11.20 (8,1121)	.001	12.09 (3,1234)	.001	11.47 (3,1608)	.001
Interactions								
School By Grade	3.32 (20,3888)	.001	1.31 (32,4135)	.11	1.69 (12,3265)	.06	1.21 (12,4255)	.27
School By Gender	1.51 (10,2344)	.13	.82 (16,2242)	.66	1.62 (6,2468)	.14	2.16 (6,3216)	.05
Grade By Gender	2.28 (10,2344)	.02	.44 (16,2242)	.97	1.36 (6,2468)	.22	.28 (6,3216)	.94
School By Grade By Gender	1.32 (20,3888)	.15	1.25 (32,4136)	.15	.69 (12,3265)	.73	1.00 (12,4255)	.44

Moreover, the actual school environment was perceived most favorably by the Grade 7 pupils. The vastly different orientation of Grades 9 and 11 can be explained, at least partly, by the tendency of many Australian adolescents to leave school after Grade 10, while those who go on to Grades 11 and 12 are by definition more academically oriented.

School type. The main effect of school type was significant in each analysis for all scales except Difficulty and Differentiation. The nature of the differences between the three types is shown in Table 5 and was discussed above.

Interaction of gender and grade. The gender effect was very stable across age. Overall, there was only one marginally significant gender and grade interaction in the analysis; this occurred for the preferred Individualization scales. Moreover, none of the univariate F-values for the individual scales was significant; that is, the interaction did not stem from a clearly identifiable source.

Interaction of grade and school type. The effects of grade and school interacted in only one analysis. It is this interaction that distinguished the first group of scales, preferred Individualization, from the second, preferred Structure. The interaction stemmed in most cases from the differences between Grades 7 and 9. On the scales of Personalization, Participation, and Independence, Grade 11 students scored highest overall and also within each school type, but whether Grade 7 or Grade 9 students scored lowest depended on the school type. In this respect, School Type C was closest to the norm (for all scales except Investigation); that is, Grade 9 scored lowest. In School Type B, however, Grade 7 scored lowest on all scales. In this least mature group of schools (from the researchers' informal point of view), then, preferred Individualization did increase as a function of age.

Environment-Achievement Relationships

Estimates of achievement for English and mathematics were obtained from all students. Those estimates were more highly correlated to actual school environment than to preferred environment. That is, overall achievement scores were found in those schools perceived generally as a happy place to be and where there were opportunities. The preferred scales that had the highest pattern of correlations with achievement were Cohesiveness, Order and Organization, Personalization, Investigation, Participation, and Rule Clarity. These scales define both the preferred individualization and structure factors. The correlations between achievement and preferance for peer conflict were extremely close to zero.

CONCLUSION

Is there a preferred high school environment? The answer appears to be "yes" according to the present research, provided that the answer is moderated by age and/or gender. Grade 7 students preferred structure and cohesiveness, which is probably not that dissimilar to the preferences of elementary classes. Grade 9 students were more disposed toward friction and competitiveness. In Australia most students are required to stay at school until Grade 9 and thus this

year includes many students who might not wish to be at school and are seeking to find an identify for themselves. The older students, who wish to appear more mature and independent, preferred more self-initiated activities but they also wished to be involved in a cohesive network. Males were found to prefer more competition whereas females preferred social harmony, a finding which is consistent with that of Owens and Straton (1980). As many males as females preferred individualization.

The differences in preferred classroom environments over ages helps to explain why some researchers have noted a "decline" in classroom environment as students progress through school. There is not so much a decline as a change of preferences. Many instruments have items from the three factors identified in this study mixed into one score. For example, if the majority of items relate to teacher-managed structure, then it is expected that there would be a decline in mean scores as the student progresses through high school. Moreover, schools that want to create environments that individual students prefer need to be flexible within the school and create different climates for students at different grade levels.

Is there one instrument that best taps the key aspects of preferred classroom environment? Clearly, this research suggests that there is not. Rather there appears to be scales from each that can be combined into an economical battery to assess the various dimensions. These include competition and friction for preference for peer conflict; independence, participation, and investigation for preferred individualization; and order and organization, teacher support, and involvement for preferred teacher-managed structure. As the CES, MCI, and ICEQ currently involve different response scales (true-false, yes-no, and five-point Likert responses), it would be preferable to use one style in assembling a new instrument for future use.

In terms of the factors identified in this study, it appears that no existing scales assess classrooms that encourage much dependence on teachers, that do not foster independence or coherence, and that discourage initiative. It is difficult to imagine many students preferring such classrooms even though some would perceive actual classrooms like this and teachers could probably remember classes and students that "work" best under these conditions. Maybe students in over-self-instruction type classes or where too much maturity and self-motivation is demanded might prefer this (opposite) type of classroom.

This study suggests many further research questions. It has been found that there were differences in classroom environment perceptions relating to age and gender, but there could be many other salient moderators. These include geographic differences (large city vs. rural city) or more subtle variables such as the school principal's style or teacher characteristics. One obvious prediction is that students in all-boys schools would prefer more self achievement whereas students in all-girls schools would prefer more cohesiveness and direction. It also would be expected that students in private independent schools would be conditioned by parents, teachers, and peers to prefer equal amounts of attributes (that is, more like Group B schools).

There are environments that students prefer and, in some instances, these environments correspond with actual environments and with environments most conducive to achievement. Therefore, some educators will wish to change the nature of the actual environments of their classrooms either to align them more closely with student preferences or to place a greater emphasis on aspects empirically linked with student learning. As teachers make systematic attempts to use assessments of actual and preferred classroom environment in improving their classrooms, they are likely to find useful the techniques outlined by Fraser (1981b) and a number of case studies of successful change attempts (Fraser & Deer, 1983; Fraser & Fisher, 1986).

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